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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/692,841

10/24/2003

Thomas C. Anthony

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9237

7590

06/16/2004

HEWLETT-PACKARD COMPANY

Intellectual Property Administration

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EXAMINER

LE, VU ANH

ART UNIT

PAPER NUMBER

2824

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/692,841

**Applicant(s)**

ANTHONY ET AL.

**Examiner**

Vu A. Le

**Art Unit**

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,9-19,22,25 and 28-34 is/are rejected.
- 7) ☒ Claim(s) 2,3,5-8,20,21,23,24,26 and 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.  
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 9-10, 15-19, 22, 28-29 and 33-34 are rejected under 35 U.S.C. 102(a) as being anticipated by Nickel et al (6,603,678).

3. With respect to claim 1, Nickel et al (Fig.1 and 3) disclose an array of thermally-assisted magnetic memory structures (Fig.3), each of said magnetic memory structures comprising: a memory cell (114); a write conductor (116 or 118 in Fig.3) contacting said memory cell, said write conductor selecting said memory cell in a first coordinate during a write operation (see col.1, lines 25-27 and col.3, lines 60-61); and a heating system (120) contacting said memory cell, said heating system: heating said memory cell during said write operation (col.4, lines 24-31); and selecting said memory cell by said heating in a second coordinate (col.4 lines 14-16 teaches "*During a write operation, a decoder 134 decodes addresses Ax and Ay to select a word line 116, a bit line 118 and a heating line 120*").

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4. With respect to claims 9-10, 15-19, 22, 28-29 and 33-34 the heating system comprises a heater line (120) and generating a magnetic field when a current source (130) is connected and the heating system contacts a plurality of memory cells.

1. Claims 1, 4, 9-19, 22, 25, 28-34 rejected under 35 U.S.C. 102(e) as being anticipated by Abraham et al (US 2003/0198113 now Patent No. 6,724,674).

5. Abraham et al (Fig.5) disclose an array of thermally-assisted magnetic memory structures comprising a memory cell (50), a write conductor (bit line 2), a heating system (word line 5 and 54), wherein said write conductor is configured to act as a sense line during a read operation (the bit line acts as a sense line during a read operation), wherein the heating system comprises a heater line (5) in series with the memory cell, wherein the heating system contacts a plurality of memory cells (the word line must connect to a plurality of memory cells).

### ***Response to Arguments***

6. Applicant's arguments filed 05/19/04 have been fully considered but they are not persuasive.

7. With respect to claim 1, the Applicant argues "Nickel does not disclose or suggest selecting the memory cell by heat in a second coordinate". This argument is found not persuasive since during write operation the heating system (line 120) must be activated selectively (by transistor 132) as described in col.4 lines 14-16. Only the heating system contacting the selected memory cell is activated by a corresponding

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transistor 132 in write operation. In other words, the heating system contacting the selected memory cell selects the selected memory cell since if other heating system NOT connecting the selected memory cell can not select the selected memory cell. So, by eliminating the need of bit line, claim 1 is still read by Nickel et al.

8. With respect to claims 9-10, 15-19, 22, 28-29 and 33-34, the Applicant has the same argument as with claim 1, therefore, claims 9-10, 15-19, 22, 28-29 and 33-34 are still ready by Nickel et al.

9. The Applicant respectfully traverses the rejection based on Abraham reference as below.

10. "Similar to Nickel, Abraham discloses conventional memory structures in which each memory cell is selected by a word line and a bit line. Abraham, col.4, lines 63-65. During memory array operation, when a sufficiently large current is passed through both a word line and a bit line of the MRAM cell, the self-field generated by the combined current at the intersection of the word and bit lines will rotate the magnetization of the free layer of the single particular cell located at the intersection of the energized word and bit lines. ABRAHAM, col. 5, lines 33-39 (emphasis added)".

This argument is not found persuasive since Abraham et al (US 2003/0198113 now Patent No. 6,724,674) disclose "The memory storage device also includes a heating element" (see Abstract). Abraham et al also disclose "**As show in Figs. 5(a) and 5(b), the memory storage device 58 of the invention includes a heating element 56** and a storage cell 50 as described above. The heating element 56 is separate from the storage cell 50 and preferably comprises a conductive layer having a

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low resistance" (col.6, lines 10-15). Abraham et al also disclose "***the heating element 56 be heated by current passing from an adjacent word line***" (col.6, lines 26-28).

This means the word line and the heating element are used as a heating system in write operation to select and heat the selected memory cell.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12. Abraham et al (US 2003/0198113 now Patent No. 6,724,674) disclose a memory device with heating element.

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu A. Le whose telephone number is (571)272-1871. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571)-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Vu A. Le  
Primary Examiner  
Art Unit 2824

06/11/04